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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/048,023	01/28/2002	Yasukazu Iwasaki	040302-0285	1241

22428 7590 01/11/2006

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EXAMINER

WACHTEL, ALEXIS A

ART UNIT	PAPER NUMBER
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1764

DATE MAILED: 01/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/048,023

Applicant(s)

IWASAKI, YASUKAZU

Examiner

Alexis Wachtel

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 13 January 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3,4,7,12 and 13 is/are allowed.
- 6) ☐ Claim(s) 1,2,5,6,8,9,10 is/are rejected.
- 7) ☒ Claim(s) 11 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>28 Jan 02</u> . | 6) <input type="checkbox"/> Other: _____  |

***Detailed Action***

***Response to Amendment***

1. Applicant's amendment and accompanying Remarks filed 11-4-05 have been entered and carefully considered.

The amendment is sufficient to overcome the obviousness rejections of claims 1-4. Claims 5-13 were added for consideration. Applicant's arguments are rendered moot in view of the new grounds of rejection.

***Claim Rejections - 35 USC § 102/103***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1,2,5,8-10 are rejected under 35 U.S.C. 102(a) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over EP 0 973 219.

With respect to claim 1, EP '219 teaches a fuel reforming system comprising a fuel reformer (2) for generating a reformed gas containing hydrogen by using a gas containing vapors of a gas fuel or a liquid fuel and a gas containing oxygen, vaporizing

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device (7) and burning device (6) together correspond to a claimed mixer, a supplier (11) of vapors of the gas fuel or the liquid fuel into said fuel reformer through the mixer, a supplier (10) of the gas containing the oxygen into said fuel reformer through the mixer, and a controller of a first flow rate of the vapors of the gas fuel or the liquid fuel supplied into said fuel reformer and of

a second flow rate of the gas containing the oxygen supplied into said fuel reformer, further comprising:

- a detector (34) of the first flow rate of the vapors;

- a detector of the second flow rate of the gas (the use of flow detector is implied if not inherently present since pump 10 as well as displacement quantity of pumps are controlled by ecu 35); and

- a temperature detector [0017] of at least one of the vapors of the gas fuel or the liquid fuel supplied into said fuel reformer,

wherein a ratio of the first flow rate of the vapors to the second flow rate of the gas is corrected depending on the output of said temperature detector, and the gas containing the oxygen is supplied depending on the corrected ratio [0074]; [0075]; [0078]. Examiner notes that cited sections of prior art disclose a ratio between fuel flow rate (corresponding to claimed vapor flow rate) and air flow rate (corresponding to claimed gas flow rate). Since temperature calculation is required to determine the optimal Air/fuel (corresponding to claimed gas/vapor ratio) the ratio is adjusted (corrected, altered, attenuated) as a function of temperature.

With respect to claim 2, the instant claim is given weight insofar as its effect on the structure of the claimed apparatus. The apparatus of the prior art is capable of carrying out the operation of the instant claim.

With respect to claim 5, EP '219 teaches that the supplier of gas containing oxygen includes a device [0043] adapted to obtain atmospheric air, the gas containing oxygen being at least in part obtained from the atmospheric air.

With respect to claim 8, EP '219 teaches the use of a temperature detector (32) that is capable of detecting the temperature of the vapors of the gas fuel or the liquid fuel. The output of the temperature detector is capable of indicating the temperature of the vapors of the gas fuel or the liquid fuel.

With respect to claim 9, EP '219 teaches the use of a temperature detector (32) that is capable of detecting the temperature of the gas containing the oxygen. The output of the temperature detector is capable of indicating the temperature of the gas containing oxygen.

With respect to claim 10, EP '219 teaches a reforming reactor (4), wherein the mixer supplies the mixture of vapors of the gas fuel or the liquid fuel and the gas containing the oxygen to the reforming reactor (Fig.20).

With respect to claim 11, EP '219 teaches a reforming reactor, wherein the mixer supplies the mixture of vapors of the gas fuel or the liquid fuel and the gas containing the oxygen to the reforming reactor, the mixture of gas and vapor supplied to the reforming reactor being non-combusted and non-converted.

5. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0 973 219.

With respect to claim 6, EP '219 teaches that the oxygen gas supply is provided by a pump [0043] that pumps air. The prior art is silent as to the use of a compressor adapted to obtain atmospheric air. However, since the prior art mentions that "air" is used, it is clear that atmospheric air is used as a source of oxygen. Furthermore, the use of an compressor would have involved routine engineering choice and is not seen to provide a particular advantage over air supplying means that sucks air into the pump without being compressed.

***Allowable Subject Matter***

6. Claim 11 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: Ep '219 teaches per claim 3 a fuel reforming method of a fuel reforming system, said fuel reforming system having a fuel reformer (2) for generating a reformed gas containing hydrogen by using a gas containing vapors of a gas fuel or a liquid fuel and a gas containing oxygen, a mixer of vapors (vaporizing device (7) and burning device (6) together correspond to the claimed mixer) of the gas fuel or the liquid fuel and the gas containing the oxygen, a first supplier (11) of vapors of the gas fuel or the liquid fuel into said fuel reformer through the mixer, and second supplier (10) of the gas containing the oxygen into said fuel reformer through the mixer. Examiner notes that the system of the

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prior art inherently carries out the following operations: supplying the liquid fuel into the first supplier; detecting a temperature of the vapor of the gas fuel or the liquid fuel supplied into said fuel reformer [0052]; (Examiner notes that temp detector 32 inherently detects temp of fuel entering fuel reformer).

However, the prior art is silent with respects to using the temperature of the fuel to calculate a first correction coefficient (as defined in Applicant's Specification by way of eqn (2) on pp.12) of a ratio of a first flow rate of the vapors of the gas fuel to a second flow rate of the gas containing the oxygen according to the detected temperature; detecting the first flow rate of the vapors; determining the second flow rate to be supplied to the second supplier according to the detected first flow rate and the determined first correction coefficient; and adjusting the flow rate of the gas containing the oxygen into said fuel reformer by controlling the second supplier according to the determined second flow rate.

At best, section [0092] of the prior art discloses that a detected temperature is used to calculate a ratio between fuel flow rate (corresponding to claimed vapor flow rate) and air flow rate (corresponding to claimed gas flow rate). Claims 4,7,12,13 depend on claim 3.


With respect to claim 11, EP "219 does not teach that the (6 and 7) corresponding to a mixer supplies the mixture of vapors of the gas fuel or the liquid fuel and the gas containing the oxygen to the reforming reactor, the mixture of gas and vapor supplied to the reforming portion being non-combusted and non-converted since

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(6) and (7) involve combusting fuel vapor and oxygen gas prior to supplying to a reforming portion (4).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alex Wachtel whose telephone number is 571-272-1455. The examiner can normally be reached on 10:30am to 6:30pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Glenn Caldarola, can be reached at (571)-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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